PC FIREMAID: User's Manual

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DSTO-GD-0064

ABSTRACT

This document forms the instruction manual for the computer based fire management training aid, called PC FIREMAID.

PC FIREMAID is a graphics based, interactive ship fire fighting simulator, which can be based on a range of naval ships.

The program was developed to be used in the training of naval personnel, specifically damage control officers, in the correct procedures of fighting ship fires including management of crew and equipment.

PC FIREMAID was written in the computer language C and versions have been written for the IBM compatible personal computer and the Commodore Amiga.

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Firemaid PC: User's Manual

Executive Summary

PC FIREMAID was developed to be used in the training of naval personnel, specifically damage control officers, in the correct procedures of fighting ship fires including management of crew and equipment.

PC FIREMAID is a real time computer simulation of the progress of a fire incident in a naval vessel. The program simulates both the crew response and the time evolution of fire incident/s. User interaction is used to manage the deployment of the ship's fire fighting resources. The final outcome of a fire incident depends critically on good resource management.

The FIREMAID simulation was originally developed to run on the Commodore Amiga range of computers. However, the widespread use of the IBM compatible PC created demand for a version of the program which would run under Microsoft Windows. This was developed and named PC FIREMAID.

Contents

1. Introduction

PC FIREMAID is a real time simulation of the progress of a fire incident in a naval vessel written for the IBM compatible personal computer. This program simulates both the crew response and the time evolution of fire incident/s. User interaction is used to manage the deployment of the ship's fire fighting resources. The final outcome of a fire incident depends critically on good resource management.

For the sake of brevity in these instructions we will define the following:

Click "object" - This means position the mouse pointer over the "object" then press and release the left mouse button. The object is now selected.

2. Startup

The PC FIREMAID program runs under Microsoft Windows and is supplied on a 3.5" floppy disk and should be installed following the instructions on the disk label. Once installed an icon will appear in the Windows group selected. Double clicking this icon will start the program.

A description of the current ship status and mission is displayed, similar to Figure 1. When ready, click the "OK" button once to start the program and initiate the incident.
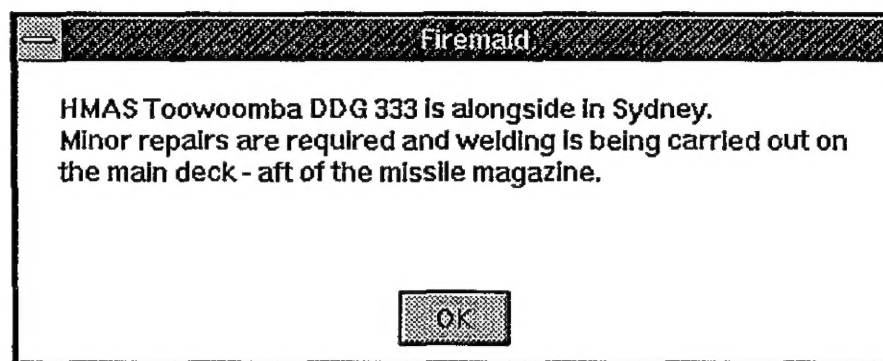
Figure 1: The current vessel, mission and environment are described on this window to give an idea of what lies ahead.

3. Simulation Instructions

The PC FIREMAID simulation takes place in the Central Control Station. You will see the damage control boards, and only know of an incident's progress as it is reported to you.

3.1 Incident Control Boards

Figure 2 shows a section of a DDG destroyer, with each deck split into 3 images. The whole of the ship's incident control board can be viewed by swapping from one image to another using the arrow keys (up, down, left, right).

Incident progress is reported by the standard navy chit system using incident progress symbols as shown in Figure 3. As an incident is reported a chit will appear for about five seconds on the left of the screen, similar to the one shown in Figure 2. The chit information is then added to the incident board.
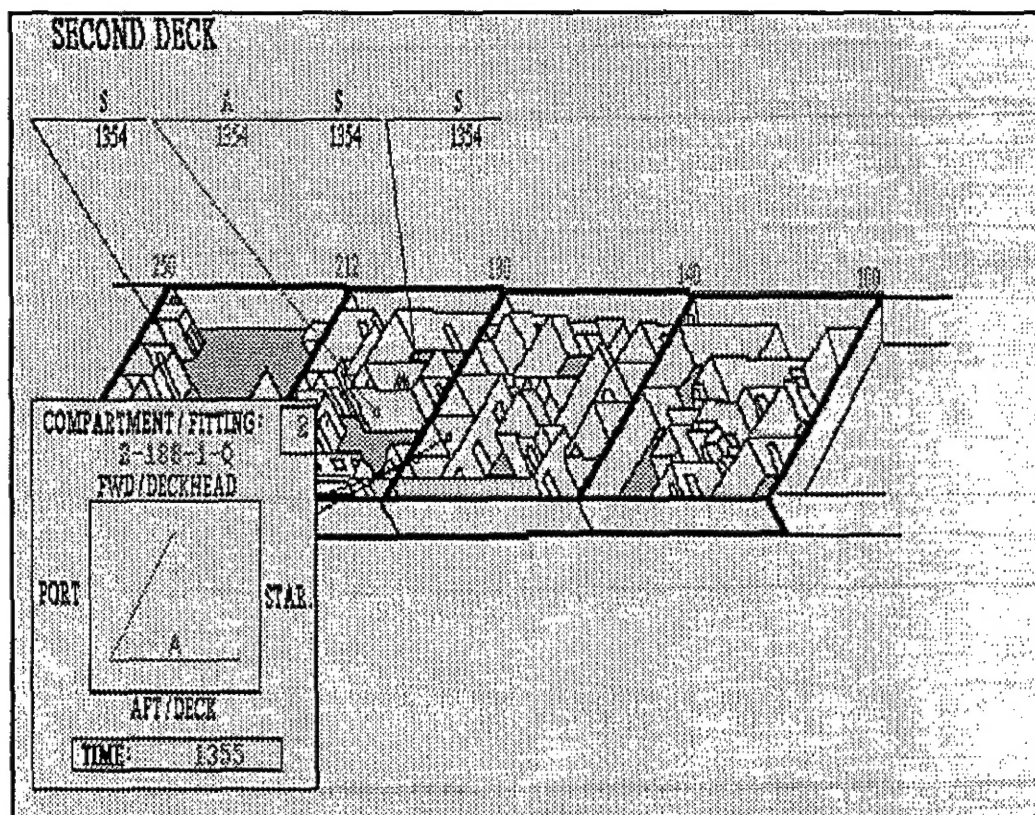

Figure 2: *An image of a section of the incident control board is displayed. A fire chit is being reported, while previous reports have been plotted on the incident board.*

INCIDENT	INCIDENT SYMBOL	INCIDENT PROGRESSION SYMBOL				
		—	╱	△	△	⟁
FIRE	A,B,C,D	REPORTED	BEING FOUGHT	OUT & REFLASH WATCH SET	O₂ TEST SAFE	OVERHAUL
FIRE BOUNDARY	F B	SET				
SMOKE	S	REPORTED	BEING CLEARED	CLEAR	O₂ TEST SAFE	
FAST FLOOD	FF RATE / DEPTH	REPORTED				
SLOW FLOOD	SF RATE / DEPTH	REPORTED	BEING PUMPED	PUMPED DRY	COMPART- MENT SECURED	

Figure 3: *The incidents are reported by the naval chit system using Incident Progression Symbols.*

4. Quit

To exit the program during execution, move the mouse pointer to the "Control Menu", shown in Figure 4, in the top left hand corner of the screen. Press and hold down the left mouse button and descend to the option "Quit" (which will be highlighted) and release the mouse button. Figure 5 shows the window that appears when "Quit" has been selected. Click on "OK" to escape from the program, or "Cancel" to resume.

Control Menu
Checklist
Response Menu
Status Screen
Quit

Figure 4: The "Control Menu" in the top left hand corner allows for user response to the event, as well as the means to exit the program.
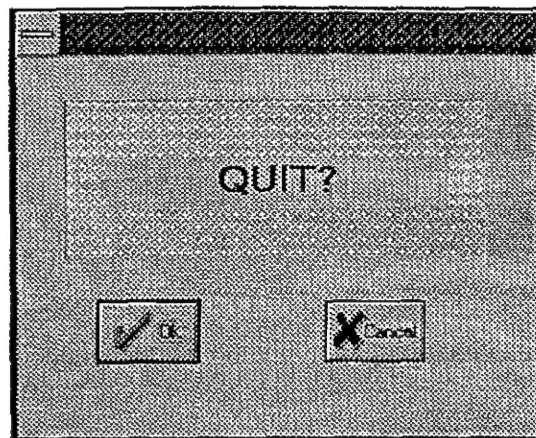
Figure 5: The window displayed when the "Quit" menu item is selected.

When all the fires are extinguished a window will appear, Figure 6, indicating this. This is an indication that the incident is over, however, it will continue to progress allowing clean up operations to be carried out by the user.
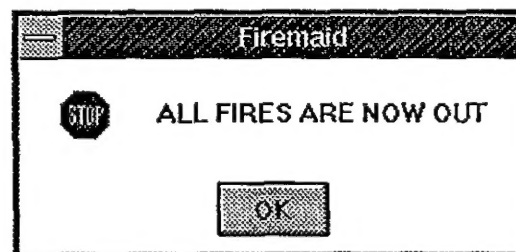
Figure 6: The window displayed when all fires have been extinguished.

5. Resource Management

To control the distribution of all ship resources, three menu items are provided in the "Control Menu", shown in Figure 4. These are selected in a manner similar to the "Quit" option.

5.1 Checklist

Select the "Checklist" menu item from the "Control Menu".

One of the two windows displayed in Figure 7 will appear. These provide a rough checklist for dealing with a fire incident. The "Checklist" is only a guide, intended as a reminder of when resources should be used.

To obtain other pages of the "Checklist", two buttons are provided in the top right corner of this window. Click on the "Next" button to go to the next page, and on the "Previous" button for the previous page. Note that the pages are cyclic, so that clicking on one button a few times will return you to the original page.
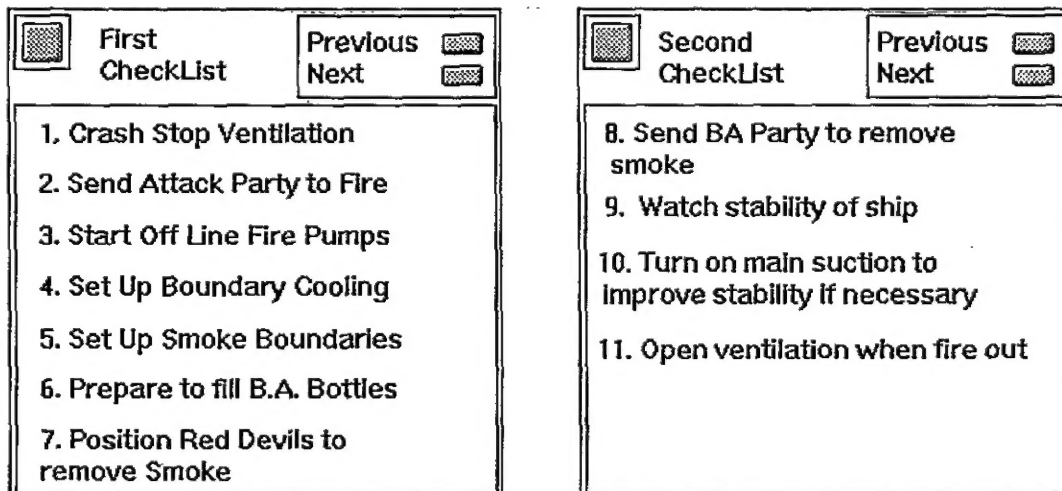
To remove the "Checklist" click on the button in the top left corner of the window.

First CheckList	Previous / Next	Second CheckList	Previous / Next
1. Crash Stop Ventilation		8. Send BA Party to remove smoke	
2. Send Attack Party to Fire		9. Watch stability of ship	
3. Start Off Line Fire Pumps		10. Turn on main suction to improve stability if necessary	
4. Set Up Boundary Cooling		11. Open ventilation when fire out	
5. Set Up Smoke Boundaries			
6. Prepare to fill B.A. Bottles			
7. Position Red Devils to remove Smoke			

Figure 7: The "Checklist" pages are a rough guide to the order of resource management required to control the incident.

5.2 Status Screen

Select the "Status Screen" menu item from the "Control Menu".

Figure 8 shows the status report that you should see on the computer screen. It reports the ship's climatic environment, draught and list, and crew and equipment availability. The report is automatically updated as events progress.

To return to the ship's damage control board, click the "OK" button on the "Status Screen" window.

5.3 Response Menu

Select the "Response Menu" menu item from the "Control Menu".

One of the three response menu pages, seen in Figure 9, is displayed. The menu provides you with resources which may influence any event in progress. To select a particular function, click the button adjacent to that function. This activates the function and issues an order.

Some of the functions require a bulkhead or compartment to be selected on an image. For these functions use the arrow keys (up, down, left or right) to access the correct section of the damage control board. Then click on the required location.

To obtain other pages of the "Response Menu" list, use the two buttons located in the top right corner of this window, in the same way as for "Checklist" paging.

To remove the "Response Menu" window, click the button in the top left corner of the "Response Menu" window.

Figure 8: The "Status Screen" lists the vessel's environment and resources.

Figure 9: *The three pages of the "Response Menu" are shown above. The resources are activated by clicking the button adjacent to each.*

The following subsections provide a description of the available response functions.

5.3.1 Move Attack Party

When this function is selected from the "Response Menu", the user must provide a location to which the party will be sent. Click on the compartment to which you want the Attack Party sent. This location will be marked by an "X" on the damage control board and an order will be issued. If an Attack Party is available and can access the compartment, it will arrive after a short delay. A message indicating the arrival will be displayed on the screen, as seen in Figure 10, and the compartment will be marked by an "A".

An Attack Party is able to reduce fire by the use of portable fire extinguishers and is effective against small fires. The time that an Attack Party takes to arrive at an incident is short and so an Attack Party should be sent to the onset of all incidents.

The personnel involved in the Attack Party are affected by temperature and smoke, and will retreat if the smoke is too thick or the temperature too high.

An Attack Party can be removed from a compartment by selecting Attack Party from the "Response Menu" then clicking on the party (A) to be removed. An Attack Party is also removed from a compartment automatically when a BA Party is ordered in.

Firemaid

Sir, attack party now in compartment 5-83-0-E : Engine room number 1

OK
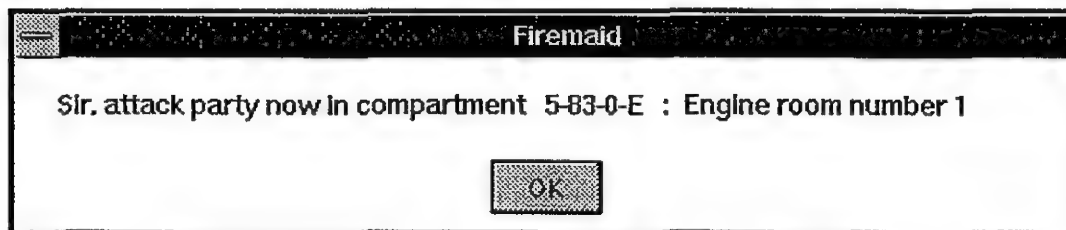
Figure 10: A message is displayed when an Attack Party arrives in a compartment.

5.3.2 Move Support and BA Party

When Breathing Apparatus/Support Party is selected from the "Response Menu", the location to which the party will be sent must be provided. Click on the compartment to which you want the BA party sent. This location will be marked by a "X" on the damage control board and the order will be issued. The BA Party will arrive, after a delay, if one is available, and a "B" will appear at the location. Any Attack Party that was in the compartment will automatically be removed when the BA Party arrives.

The BA Party reduces fire by use of fire hoses. This is effective against small and medium sized fires and is considerably more effective than an Attack Party. The water used by a BA Party will drain to lower decks and slow flooding may result.

The personnel involved are effected by heat and will retreat if the temperature is too high. Also, when the air bottles become empty then the BA Party will be forced out of the compartment.

A BA Party can be removed from a compartment by selecting the BA/Support Party option then clicking on the "B" to be removed.

5.3.3 Check Compartment

Often the status of an unoccupied compartment may be required. When this option is selected from the "Response Menu", a request for a location will appear. Crew will be sent to check the compartment nearest your mouse click. This will ensure that if that compartment is unoccupied, any unreported incident will be reported.

Checking occupied compartments, which include those with Attack Parties or BA/Support Parties, is unnecessary as events in these are automatically updated.

5.3.4 Boundary Cooling : Bulkhead

Having chosen to cool a bulkhead from the "Response Menu", the location of the bulkhead needs to be determined. Use the arrow keys to select the correct section of the damage control board and click on the bulkhead to be cooled. The chosen boundary is indicated by a green line. A delay, while the crew prepare, occurs before cooling is initiated.

Water is hosed onto the bulkhead to reduce the temperature of the adjacent compartments. This water will increase the ships internal free water and add to flooding.

To stop boundary cooling, repeat this process, clicking on an existing green bulkhead.

5.3.5 Boundary Cooling : Deck

Deck boundary cooling restricts the spread of fire vertically. When this option is selected from the "Response Menu", a location needs to be provided. If you require a deck to be cooled, click on the required deck. If you require the deckhead to be cooled, indicate this by clicking on the deck of the level above (between the appropriate bulkheads). The cooled area is bounded by a blue border. A delay, while the crew prepare, occurs before cooling is initiated.

Water is hosed onto the deck to reduce the temperature of the compartments on the deck below. This water will add to the ships internal free water and result in increased flooding.

To end deck cooling, choose this option again and click within an existing blue deck outline.

5.3.6 Ventilation (Open/Close)

Clicking the Ventilation button will either open or close all the ship's ventilation, whose state may be checked in "Status Screen". A window will open confirming the change.

With all the ventilation open on the ship, both smoke and air is allowed to flow between compartments and the outside environment. The spread of smoke can be halted and the intensity of the fire reduced by closing the ventilation.

When a fire is extinguished, smoke is no longer being generated and so opening the ventilation will clear the air in the ship.

5.3.7 Main Suction (On/Off)

Main suction is used to remove water from the ship. This option makes the main suction (venturi pump) available to all parts of the ship. It will correct the list angle and improve the draught of the vessel.

When the main suction is no longer required, turn it off.

5.3.8 Turn Alarm(s) Off

This "Response Menu" item will turn off the current event alarm only. If future events occur, the alarms will automatically activate.

Alarms can only be activated for fires, smoke and flooding in compartments that have alarms. Other compartments must be manually checked.

5.3.9 Turn On Fire Pumps (On/Off)

To maintain fire main pressure at full capacity while fire fighting is underway requires that all fire pumps are on line and charged. This option increases the amount of available water to the fire fighting crews, and thus their effectiveness in fighting the fire.

5.3.10 Start Filling Air Bottles (Off/Ready)

BA Parties require bottled air. If the bottle supply is not maintained then the BA Party will be unable to continue. It must be remembered that it takes considerably longer to fill the air bottles required by a BA team than to empty them. Thus filling the extra bottles must be started early in large incidents.

5.3.11 Smoke Boundary

Smoke boundaries are set up at major bulkheads to restrict smoke flow through the bulkhead. When this option is selected from the "Response Menu", a bulkhead must also be chosen. Use the arrow keys to select the correct section of the damage control board and click on the bulkhead at which a smoke boundary is to be maintained. The affected bulkhead is indicated by a red line. The crew will take a short time to set up this boundary.

To remove a smoke boundary, select this option from the "Response Menu" and click on the existing red boundary to be removed.

5.3.12 Add Red Devil Smoke Pump

The Red Devil smoke pumps are used to remove smoke from a compartment. On selecting this function a location needs to be provided. Chose the desired damage control board image with the arrow keys, and click on the compartment to be cleared of smoke. The position of these, when the order is given, is indicated by an "X", and when in use, by an "R" on the damage control board.

To remove a Red Devil Smoke Pump from a compartment, choose this function and click on the "R".

DEFENCE SCIENCE AND TECHNOLOGY ORGANISATION	1. PAGE CLASSIFICATION
	UNCLASSIFIED
DOCUMENT CONTROL DATA	2. PRIVACY MARKING/CAVEAT (OF DOCUMENT)

3. TITLE	4. SECURITY CLASSIFICATION (FOR UNCLASSIFIED REPORTS THAT ARE LIMITED RELEASE USE (L) NEXT TO DOCUMENT CLASSIFICATION)		
PC FIREMAID: User's Manual			
		Document	(L)
		Title	(U)
		Abstract	(U)

5. AUTHOR(S)	6. CORPORATE AUTHOR
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7a. DSTO NUMBER	7b. AR NUMBER	7c. TYPE OF REPORT	8. DOCUMENT DATE
DSTO-GD-0064	AR-009-409	General Document	November 1995

9. FILE NUMBER	10. TASK NUMBER	11. TASK SPONSOR	12. NO. OF PAGES	13. NO. OF REFERENCES
510/207/0267	92/338		20	-

14. DOWNGRADING/DELIMITING INSTRUCTIONS	15. RELEASE AUTHORITY
To be reviewed three years after date of publication	Chief, Ship Structures and Materials Division

16. SECONDARY RELEASE STATEMENT OF THIS DOCUMENT

A ... l and their equivalent in UK, USA, Canada and NZ may have
a ... Chief, Ship Structures and Materials Division AMRL

Approved for Public Release

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NO LIMITATIONS   nel and others engaged in defence activities in Australia and their

18. CASUAL ANNOUNCEMENT	YES/NO (Cross out whichever is not applicable)

19. DEFTEST DESCRIPTORS

Ship fires; Training; FIREMAID; Computer simulation

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